

ACC NR: AP6024026

vacuum apparatus used for the purpose is described. The sodium, potassium, and rubidium filters had respective transmission maxima of 16, 40, and 9% at 1600, 2500, and 2600 Å. The transmission of all filters in the visible region (~5000 Å) was of the order of 2%. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 09Sep65/ ORIG REF: C01/ OTH REF: 008

Card 2/2 *PK*

ACC NR: AP6035093

SOURCE CODE: UR/0252/66/043/001/0028/0031

AUTHOR: Gurzadyan, G. A.

ORG: Branch of the Byurakansk Astrophysical Observatory of the Academy of Sciences
Armenian SSR (Filial Byurakanskoy astrofizicheskoy observatorii Akademii Nauk
Armyanskoy SSR)

TITLE: A powerful x ray flare-up on the Sun

SOURCE: AN ArmSSR. Doklady, v. 43, no. 1, 1966, 28-31

TOPIC TAGS: solar activity, solar flare, solar x radiation

ABSTRACT: The author describes an x ray flare-up on the Sun observed with a rocket at the height of 400 km on 1 October 1965. It was recorded with a number of boxes (camera obscura) of 10 mm focal length and 1 mm opening. Aluminum filters were placed before the openings. The filters varied in thickness from 5μ to 0.2μ so that the cameras recorded on a film the x ray images of the Sun in two wavelength ranges: 0 to 8 Å and 8 to about 60 Å, respectively. The x ray energy flux was estimated to be about 10^9 photons/cm² sec in the shorter wavelength range and 10^{10} photons/cm² sec in the longer one. This represents, in comparison with the normal flux from the quiet Sun, an increase by one order of magnitude for the longer, and by three or four orders for the shorter wavelength range. The observed x ray flare-up approximately coincides in

Card 1/2

ACC NR: AP6035093

time with an increase of solar activity in other respects (radioemission, chromospheric flares). The x ray flare-up cannot be attributed to bremsstrahlung or to the synchrotron mechanism. To explain the high effective temperature of the emission (about 10^9 °K), one must ascribe it to nuclear disintegration of matter ejected from the internal parts of the Sun through the Sun's spots. Orig. art. has: 1 table.

SUB CODE: 03/ SUBM DATE: 25Jan66/ ORIG REF: 004/ OTH REF: 004

Card 2/2

ACC NR: AR6031890 SOURCE CODE: UR/0058/66/000/006/E095/E095

AUTHOR: Turyanitsa, I. D.; Chepur, D. V.; Golovey, M. I.; Solyanik, E. Yu.; Gurzan, M. I.

TITLE: Specific characteristics of antimony iodide photoconductivity and absorption

SOURCE: Ref. zh. Fizika, Abs. 6E749

REF SOURCE: Sb. Tezisy dokl. k XIX Nauchn. konferentsii. Uzhgorodsk. un-t, 1965, Ser. fiz. Uzhgorod, 1965, 58-65

TOPIC TAGS: iodide, antimony, antimony iodide, x ray structural analysis, dark current, main absorption band

ABSTRACT: The photoelectrical and optical properties of SbI_3 specimens obtained by crystallization from the vapor phase in air or vacuum were investigated. X-ray structural analysis showed that the specimens obtained were single-crystals and that those obtained under vacuum were more perfect than those grown in air. The dark current depends exponentially on the temperature and has an activation energy of 0.9 ev. The width of the forbidden band determined on the basis of the longwave boundary of the main absorption band corresponds to 2.14 ev. It follows, therefore,

Card 1/2

ACC DIR AR6031890

that Sb_2S_3 conductivity is due to impurities. The spectral characteristics of Sb_2S_3 photoconductivity is selective and contains 2 maxima in the vicinity of 4500 and 5500 Å. Apparently the presence of a photoconductivity maximum in the region of the longwave boundary of the absorption band is related to the dependence of the carriers' life on the wavelength. It was observed that an increase in temperature resulted in a decrease of the forbidden-band width with a temperature coefficient equal to $16 \cdot 10^{-4}$ ev/degree. F. Nad'.

SUB CODE: 20/

Card 2/2

GURZEDA, A.

Gurzeda, A. Production methods in ponds; a discussion p. 7.

GOSPODARKA RYBNA

Vol. 7, no. 5, May 1955

Warszawa, Poland

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 5, No. 10 Oct. 56

GURZEDA, A.

Ecologic relations between invertebrates and submerged plants. p. 139

EKOLOGIA POLSKA. SERIA B. (Polska Akademia Nauk. Komitet Ekologiczny)
Warszawa, Poland
Vol. 5, no. 2, 1959

Monthly list of East European Accession (FFAT) LC, vol 9, no. 1, Jan. 1960

Uncl.

GOROVY, P.G.; GURZENKOV, E.N.

Polygonatum inflatum Kom., a new species of Solomon's seal in the
Soviet Far East. Bot. zhur. 48 no.7:1037-1038 J1 '63.

(MIRA 14:6)

1. Biologo-pochvennyy institut Dal'nevostochnogo filiala Sibirskogo
otdeleniya AN i Dal'nevostochnyy gosudarstvennyy universitet,
Vladivostok.

(Soviet Far East--Solomon's seal)

S/139/60/000/005/001/031
E032/E114

AUTHORS: Finkel', V.M., and Gurzhoyev, V.N.

TITLE: A Study of Small Angle Scattering in Elastically and Plastically Strained Copper.¹

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No. 5, pp 3-7

TEXT: The scattering of X-rays in the small angle region, i.e. in the region close to the primary beam, is determined by the distribution and size of the microstructure of the material under investigation. The present paper reports two methods for studying the small angle scattering in elastically and plastically strained copper. In the first method the primary X-ray beam is very narrow and this is achieved by careful collimation. This method requires long exposures (of the order of 100 hours). If a counter is employed as the detector, considerable errors are introduced owing to an appreciable X-ray background due to the scattering by slit edges and to cosmic radiation. From the experimental point of view, the method is very difficult and requires high-output tubes. The second method is based on the apparatus described by Zhurkov and Slutsker (Ref. 6). Here, a divergent beam is limited on one

Card 1/4

S/139/60/000/005/001/031
E032/E114

A Study of Small Angle Scattering in Elastically and Plastically Strained Copper

side by a screen and a baffle placed at a distance from each other. The baffle serves to absorb the radiation scattered by the edge of the screen. In this method angles of the order of 1° from the primary beam can be investigated. The present authors have modified the Zhurkov-Slutsker method as follows. A wide monochromatized beam is passed through a collimator consisting of three slits. The width of the first and second slits can be adjusted within the range 0.3-0.5 mm and the actual width is chosen so as to obtain the maximum possible intensity as well as a geometrically sharp beam on one side. The optimum slit widths are chosen empirically. The third slit is in the form of a lead baffle having a sharp edge and absorbs radiation scattered by the edge of the second slit. In practice this baffle is brought right up to the beam without actually entering it. The total length of the collimating system is 160 mm. The specimen is placed immediately behind the baffle and coincides with the centre of rotation of the counter. A 0.1 mm wide slit is placed in front of the counter.

Card 2/4

S/139/60/000/005/001/031
E032/E114

A Study of Small Angle Scattering in Elastically and Plastically Strained Copper

A schematic drawing of the device is shown in Fig. 1 in which 1 is the slit system, 2 is the X-ray beam, 3 is a monitor, 4 is the X-ray machine (type YPC-554 (URS-55)), 5 is the specimen, 6 is a goniometer, and 7 is the working counter. The scattered radiation is detected by self-quenching counters of type MCTP-4 (MSTR-4). In the absence of the specimen, the primary beam was found to be in the form of a sharp Gaussian curve. The region where the intensity increases very rapidly (1000-4000 pulses/sec in the first minute) was taken as the starting point for the measurements. The total width of the primary beam was about 20'. The device has been used to measure X-ray scattering in the region up to 2-3'. Since the experiments were only preliminary, all the measurements were carried out in air. Figs 2-4 show the intensity of the X-rays (pulses/sec) as a function of angle from the primary beam for thin (0.3-0.4 mm) copper foils subjected to different mechanical and heat treatments.

Card 3/4

S/139/60/000/005/001/031

E032/E114

A Study of Small Angle Scattering in Elastically and Plastically Strained Copper

Acknowledgements are made to A.I. Slutsker for valuable advice and Professor Doctor of Technical Sciences Yu.V. Grdin, in whose laboratory the present work was carried out.

There are 4 figures and 25 references: 14 English, 5 Soviet, 3 German and 2 international.

ASSOCIATION: Sibirskiy metallurgicheskiy institut imeni S. Ordzhonikidze
(Siberian Metallurgical Institute imeni S. Ordzhonikidze)

SUBMITTED: July 6, 1959

Card 4/4

GURŽI, R.N.

SUBJECT USSR / PHYSICS
AUTHOR GURŽI, R.N.
TITLE On the Scattering of Photons by Nucleons.
PERIODICAL Žurn.eksp.i teor.fiz, 30, fasc.6, 1079-1083 (1956)
Issued: 8 / 1956 reviewed: 10 / 1956

CARD 1 / 2

PA - 1399

This cross section is here computed by the semiphenomenological theory in consideration of damping. Because of the meson field which surrounds the nucleon, the scattering cross section of photons by nucleons must be distinguished from the well-known formula by KLEIN-NISHINA; the cross section probably depends resonance-like on energy. Computations carried out in this connection meet with the basic difficulties of the present meson theory. This is why the semiphenomenological theory is employed in this case.

At first the LAGRANGIAN of the interaction of a nucleon with light is written down. The incident photon is characterized by the polarization vector $\vec{\epsilon}$ and the four-momentum $k(\vec{k}, i\omega)$, but the four-momentum of the nucleon in the initial state is denoted by $p(p, iE)$. Next, the ansatzes for U and A ($F_{\mu\nu} = \partial A / \partial x_\nu - \partial A_\mu / \partial x_\nu$) are written down. The quantities occurring in these expressions are developed according to polynomials and the corresponding coefficients of development are given. The scattering cross section in consideration of damping is determined by the method of integral equations by HEITLER. The equations for the matrix element $U(n^+, p, \gamma)$ and for the amplitude $F(n^+)$ of the photo production $\gamma + p \rightarrow n + \pi^+$ are solved by decomposition of the quantities U and F according to a system of orthogonal polynomials. The results

Žurn.eksp.i teor.fiz, 30, fasc.6. 1079-1083 (1956) CARD 2 / 2 PA - 1399

following therefrom as well as the differential and integral cross section are given in the center of mass system. For the integral cross section of the scattering of light by protons the following values are obtained:

ω (in MeV)	280	340	400
$\sigma \cdot 10^{-31}$	11,6	21,3	20,3

In the center of mass system the maximum, as expected, is about $\xi \sim \omega$, which corresponds to an energy of $\omega \sim 340$ MeV in the laboratory system. At the same time, but independently, a similar computation was carried out by V.I.RITUS. However, the course taken differs in the case of these two forms of computation. There is also a difference in numerical results, which appears to be connected with the selection of the constants.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR

GURZHI, R. I.

2
1. Page

4157

ON THE SCATTERING OF PHOTONS BY NUCLEONS. R. I. Gurzhi (Academy of Sciences, USSR). Soviet Phys JETP 3, 944-945 (1957). 180.

How
Set

The cross section for scattering of photons against nucleons is computed on the basis of a semiphenomenological isobaric theory including absorption. (auth)

Page

404

GURZHI, R.N.

56-2-20/47

AUTHOR: Gurzhi, R.N.

TITLE: A Quantum Kinetic Equation for Electrons in a Metal (Kvantovoye kineticheskoye uravneniye dlya elektronov v metallakh)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 2(8)pp.451-458 (USSR)

ABSTRACT: A method must be worked out, which takes into consideration at the same time the quantum phenomena as well as the anomalous character of the skin effect. This can be effected by using the quantum kinetic equation and the present paper derives such an equation. The author starts out from a system consisting of N electrons included in a macroscopic volume V . For the quantum mechanical description of such systems an operator F is best suited, which satisfies the equation $\partial F / \partial t = [H, F] \equiv (1/i\hbar) (\hat{H}F - F\hat{H})$ and the normalization condition $\text{Sp} F = 1$, H denoting the Hamiltonian of the system. This operator F supplies the entire statistical description of the system. The author here employs the so-called statistical representation of the density matrix

$$f(p, x, t) = (2\pi\hbar)^{-3N} \int d\tau q \left(x - \frac{\tau}{2}, x + \frac{\tau}{2} \right) e^{-i\tau p/\hbar}.$$

The author considers a system consisting of electrons, photons and phonons of the lattice and uses the method of Bogolyubov and Gurov for the derivation of the kinetic equations. The derivation discussed here is based on perturbation theory. The electromagnetic field can be regarded as an external field which satisfies Maxwell's

Card 1/2

A Quantum Kinetic Equation for Electrons in a Metal.

56-2-20/47

equations. The Hamiltonian of this system and the operator of the interaction of the electron with the phonon is given. If the field is zero, the distribution of the electrons is homogeneous and independent of time. Any deviation from this distribution is caused by the electromagnetic field. The subsequent steps of the computation are traced step by step and the kinetic equation found in this way is given explicitly. There are 7 Slavic references and no figure.

ASSOCIATION: Institute of Physics imeni P.N.Lebedev, A^N of the USSR
(Fizicheskii institut im.P.N.Lebedeva AN SSSR)

SUBMITTED: February 12, 1957

AVAILABLE: Library of Congress.

Card 2/2

GURZHI, R.N.

AUTHOR: Gurzhi, R.N. 56-3-18/59
TITLE: On the Theory of the Absorption of Electromagnetic Waves in Metals in the Infrared Region of the Spectrum. (K teorii pogloshcheniya elektromagnitnykh voln v metallakh v infrakrasnoy oblasti spektra)
PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 3, pp. 660-668 (USSR)
ABSTRACT: The absorption of electromagnetic waves in metals is represented theoretically by means of quantum-kinetic equations; the corresponding systems of equations are deduced. In putting up these equations both the quantum properties of the electromagnetic field and the anomalous character of the skin effect are taken into account. Furthermore, we must not forget that the equations are based on the condition that the Fermi surface for the electrons of the metal is of spherical form. Probably the equations can be applied only with semi-crystalline samples. The special characteristics at low temperatures, namely that the electron collisions play already a noticeable role, will be dealt with in a later work. There are 1 figure and 4 Slavic references

Card 1/2

On the Theory of the Absorption of Electromagnetic Waves
in Metals in the Infrared Region of the Spectrum.

56-3-18/59

ASSOCIATION: Physical
Physics Institute ~~Imeni~~ P.N. Lebedev, USSR Academy of Sciences (Fizicheskij
institut imeni P.N. Lebedeva Akademii nauk SSR)

SUBMITTED: February 16, 1957

AVAILABLE: Library of Congress

Card 2/2

GURZHI, R. N., Cand Phys-Math Sci -- (diss) "Quantum theory of absorption of electromagnetic waves in metals in the infrared *range* of *its spectrum*. ~~spectral region~~." Khar'kov, 1958. 8 pp (Min of Higher Education Ukr *SSR*, Khar'kov Order of Labor Red Banner State Univ im A. M. Gor'kiy), 100 copies (KL, 18-58, 94)

24(4)

AUTHOR:

Gurzhi, R. N.

SSV/56-15-4-20/3.

TITLE:

On Taking Into Account the Electron-Intercorrelation
in Metal-Optics (Ob uchete vzaimnoy korrelyatsii elektronov
v metallooptike)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1956,
Vol 35, Nr 4, pp 965 - 969 (USSR)

ABSTRACT:

The present paper investigates the absorption of the
electromagnetic field in metals in the infrared
spectral range on the basis of the theory of the
Fermi-liquid developed by Landau (Ref 1). This problem
was already dealt with by V.P.Silin (Ref 2), in
whose paper the classical equation of motion was used
for describing the Fermi-liquid, whereas in the
infrared range the quantum-properties of the electro-
magnetic field must be taken into account (cf. Refs 3-5)
when calculating volume absorption (which occurs at
the expense of collisions among electrons and collisions
with the phonon lattice. It is assumed that for system

Card 1/3

On Taking Into Account the Electron-Intercorrelation
in Metal-Optics

SOV/53-55-4-20/52

in a state near equilibrium, it applies for the energy of quasiparticles that $\epsilon(\vec{p}, \vec{r}, t) = \epsilon^0(\vec{p}) + \delta\epsilon(\vec{p}, \vec{r}, t)$, where $\epsilon^0(\vec{p})$ denotes the dispersion law (without external field); otherwise it holds that $\delta\epsilon(\vec{p}, \vec{r}, t) = \int dp' \phi(\vec{p}, \vec{p}') \delta f(\vec{p}', \vec{r}, t)$; $\delta f(\dots)$ is the nonequilibrium correction to the distribution function which is in the following explicitly written down. Further, a quantum equation of motion for the electron system (linear approximation) is set up, which describes the interaction of quasiparticles with the lattice oscillations and the collisions among these particles. This equation is further dealt with. On the basis of special cases the author carries out a short investigation of the classical limiting case ($\hbar\omega/kT \rightarrow 0$) and of the form of the phonon-conductivity tensor for $\hbar\omega \gg kT$, for low ($T \ll \theta$) and high ($T \gg \theta$) temperatures and for static electric conductivity. Finally, formulae for the collision frequencies

Card 2/3

$\nu^{(ef)}(T, \omega)$ and $\nu^{(ec)}(T, \omega)$ are given for the case

On Taking Into Account the Electron-Intercorrelation
in Metal-Optics

307/54-22-2-22, 22

of an isotropic Fermi surface. (ef: electron-phonon
lattice, ee: electron-electron collisions). In con-
clusion the author thanks M.I.Kaganov and M.Ya.
Azbel' for discussing the results of the present
study. There are 5 Soviet references.

ASSOCIATION: Fiziko-tehnicheskii institut Akademii nauk Ukrainiskoy SSR
(Physico-Technical Institute of the Academy of Sciences
of the USSR).

SUBMITTED: April 27, 1958

Card 3/3

Gurzhi, R. N.

S/056/60/038⁸²⁰²⁵/02/31/061
B006/B011

18.8100
24.4500

AUTHORS:

Gurzhi, R. N., Asbel', M. Ya.

TITLE:

Electron Relaxation Time in a High-frequency Electro-
magnetic Field and the Surface Impedance of a Metal

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 2, pp. 524 - 528

TEXT: The authors investigated the influence of quantization of the electromagnetic field and the electron orbits in a constant magnetic field on the relaxation time of electrons in a metal in connection with electron-phonon interactions, and again this influence on the surface impedance of the metal. The first part of the present paper deals with the influence of quantum effects on the electron-phonon collision frequency. Only the results of an exact analysis of the respective equations are discussed, first of all, for the normal skin-effect region (free path length $\ell \ll$ skin depth δ) and for the infrared region ($v/\omega \ll$ skin depth), since analysis is relatively simple in this region.

Card 1/3

Electron Relaxation Time in a High-frequency
Electromagnetic Field and the Surface
Impedance of a Metal

82025
S/056/60/038/02/31/061
B006/B011

Quantum effects are inconsiderable in the first case, and it is likewise found in the second case that the quantization of electronic levels in the magnetic field exerts no appreciable influence either. The effect of quantization of the electromagnetic field in the infrared region had been investigated already earlier (Ref. 4). Concerning the anomalous skin-effect region ($l \gg \delta$) several general considerations are discussed (classical effects and quantum effects, with and without magnetic field). Only the case of $\Omega \ll \omega$ is dealt with here, namely, in the second part of the paper, which is devoted to an investigation of the relaxation time with cyclotron resonance in metals (Ω - cyclotron frequency). The anomalous skin effect in the presence of a constant magnetic field parallel to the metal surface had already been investigated by M. Ya. Azbel' and E. A. Kaner, and expressions had been derived for the surface impedance in arbitrary fields. Only the limiting cases of weak and strong magnetic fields are briefly dealt with here, whereas the resonance region, where surface impedance is considerably dependent on relaxation time, is investigated in greater detail. Quantization in the magnetic field is not considered. The results obtained only refer

Card 2/3

Electron Relaxation Time in a High-frequency
Electromagnetic Field and the Surface
Impedance of a Metal

S/056/60/038/02/31/061
B006/B011

to the harmonics of the cyclotron resonance ($\omega \approx 2\Omega, 3\Omega, \dots$) with $\Omega < \omega$, and provided that $k\theta \gg \hbar\omega \gg kT$. Orbit quantization is found to be of essential importance only in the region of the anomalous skin effect, namely, at $\Omega \gtrsim kT/\hbar$. Electromagnetic field quantization is always considerable in the infrared region and in the region of the anomalous skin effect in the presence of a constant magnetic field (in the entire region of the magnetic fields if $\omega \sim \Omega$, and only with cyclotron resonance if $\omega \gg \Omega$). There are 9 references: 7 Soviet, 1 American, and 1 Canadian.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR
(Institute of Physics and Technology of the Academy of
Sciences of the Ukrainskaya SSR)

SUBMITTED: August 12, 1959

Card 3/3

37869

S/056/62/042/006/034/047
B104/B108

24700

AUTHORS: Azbel'. M. Ya., Gurzhi, R. N.

TITLE: Electroconductivity of thin specimens, and the possibilities of determining the free path of electrons in metals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1632 - 1635

TEXT: The electron-phonon collision frequency in thin metal plates can be much greater than in massive metal. Since the temperature dependence of the electric resistance of thin metal plates is mainly determined by the electron-phonon collision, it is smoother than would correspond to Fuchs' formula. Further, the electric resistance of thin metal plates is temperature-dependent down to lower temperatures than that of massive metal. The residual resistance of a thin plate is not attained at $l_{ep}^{\infty} \sim l_{ei}$ as is the case with massive metal, but only at $l_{ep}^{\infty} (T/\theta)^2 \sim l_{ei}$. l_{ep}^{∞} is the free path of electrons in electron-phonon collisions, l_{ei} is the effective free path in electron-impurity collisions. The possibility of determining

Card 1/2

S/056/62/042/006/034/047
B104/B108

Electroconductivity of thin ...

experimentally the free path of electrons from the temperature dependence of the electric resistance is pointed out. There is 1 figure.

ASSOCIATION: Fiziko-tekhnicheskii institut Akademii nauk USSR (Physico-technical Institute of the Academy of Sciences UkrSSR) ✓

SUBMITTED: January 21, 1962

Card 2/2

S/056/62/043/003/037/063
B108/B102

24. 00
AUTHORS: Gurzhi, R. N., Tsukernik, V. M.

TITLE: High-frequency magnetic susceptibility of ferromagnetic dielectrics in a longitudinal magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 3(9), 1962, 977 - 983

TEXT: Using a method-similar to Bogolyubov's (ZhETF, 17, 614, 1947) the authors got the following quantum kinetic equation (linear approximation with regard to the variable field $h_t = h_0 e^{-i\omega t}$) for the distribution function $F_k = \langle a_k^+ a_k \rangle$ of spin waves:

$$-i\omega f_k = L_k h_0 + \hat{W} f_k; \quad (11)$$

$$L_k = (\pi\mu\omega/2) |B_k|^2 (2\tilde{n}_k + 1) \tilde{e}_k^{-2} [\delta_- (-2\tilde{e}_k - \hbar\omega) - \delta_- (2\tilde{e}_k - \hbar\omega)] +$$

$$+ 4\pi\mu\omega \sum_{12} \frac{|Q_{k1;2}|^2}{e_{k1;2}^2} [(1 + n_k + n_1) n_2 - n_1 n_k] [\delta_- (e_{2;1k} - \hbar\omega) - \delta_- (e_{k1;2} - \hbar\omega)] +$$

Card 1/4

High-frequency magnetic...

S/056/62/043/003/037/063
B108/B102

$$\begin{aligned}
 & + 2\pi i \omega \sum_{12} \frac{|\Phi_{12; k}|^2}{e_{12; k}^2} [(1 + n_1 + n_2)n_k - n_1 n_2] [\delta_-(e_{12; k} - \hbar\omega) - \delta_-(e_{k; 12} - \hbar\omega)], \\
 \mathcal{W}_{fk} = & \frac{4\pi}{\hbar} \sum_{12} |\Phi_{k1; 2}|^2 [(1 + n_k + n_1) f_2 + (n_2 - n_k) f_1 + (n_2 - n_1) f_k] \times \\
 & \times [\delta_-(e_{k1; 2} - \hbar\omega) + \delta_-(e_{2; k1} - \hbar\omega)] + \frac{2\pi}{\hbar} \sum_{12} |\Phi_{12; k}|^2 [(n_2 - n_k) f_1 + \\
 & + (n_1 - n_k) f_2 - (1 + n_1 + n_2) f_k] [\delta_-(e_{k; 12} - \hbar\omega) + \delta_-(e_{12; k} - \hbar\omega)] + \\
 & + \frac{16\pi}{\hbar} \sum_{123} |\Phi_{k1; 23}|^2 \{ [n_1 (n_2 + 1) (n_3 + 1) - (n_1 + 1) n_2 n_3] f_k + [n_k (n_2 + 1) \times \\
 & \times (n_3 + 1) - (n_k + 1) n_2 n_3] f_1 + [n_k n_1 (n_3 + 1) - (n_k + 1) (n_1 + 1) n_2] f_2 + \\
 & + [n_k n_1 (n_2 + 1) - (n_k + 1) (n_1 + 1) n_2] f_3 \} [\delta_-(e_{k1; 23} - \hbar\omega) + \\
 & + \delta_-(e_{23; k1} - \hbar\omega)].
 \end{aligned}$$

Card 2/4

High-frequency magnetic...

S/056/62/043/003/037/063
B108/B102

with $F_\alpha|_{t=0} = n_\alpha = (e^{\epsilon_\alpha/T} - 1)^{-1}$ and $\langle a_\alpha^\dagger a_\beta^\dagger a_\gamma \rangle|_{t=0} = 0$.

$\epsilon_k = \theta_{\text{Curie}} (ak)^2 + \mu H + |B_k|$. At high frequencies it is sufficient to consider the term $-i\omega f_k = L_k h_0$. From this equation the high-frequency magnetic susceptibility of a ferrodielectric with one magnetic sublattice can be calculated keeping in mind that magnetization too can be expressed in terms of the spin wave distribution function:

$$V^{-1} \langle M_z \rangle = M_0 - \frac{\mu}{V} \sum_k \langle a_k^\dagger a_k \rangle, \quad \langle a_k^\dagger a_k \rangle = \text{Sp } \rho a_k^\dagger a_k, \quad (6).$$

Thus, $\chi = -\frac{i\mu}{\omega V} \sum_k L_k$. V is the volume of the body. The real part of magnetic susceptibility which is related to dispersion is

$$\text{Re } \chi = \frac{\mu}{\omega V} \sum_k \text{Im } L_k.$$

The predominant term in $\text{Im } L_k$ is the one proportional to $|B_k|^2$. Con-

Card 3/4

High-frequency magnetic...

S/056/62/043/003/037/063

B108/B102

sidering this and using the symbols $x = \sqrt{\theta_{\text{Curie}}/T} ak$, $\alpha = \hbar\omega/T$,
 $\eta = \mu H/T$, $\gamma = 4\pi\mu M_0/T$ and $w = \mu^2/a^3$ the result is

$$\text{Re } \chi = \frac{w}{4T} \left(\frac{\mu M_0}{T} \right)^2 \left(\frac{T}{\theta_c} \right)^{1/2} \int_0^\pi \sin^2 \theta d\theta \int_{-\infty}^\infty \frac{\text{cth}(y(x)/2)}{y(x)} \frac{x^2 dx}{y^2(x) - \alpha^2/4} \cdot$$

$$y(x) = \sqrt{(x^2 + \eta)^2 + \gamma (x^2 + \eta) \sin^2 \theta}.$$

ASSOCIATION: Fiziko-tehnicheskiy institut Akademii nauk Ukrainskoy SSR
 (Physicotechnical Institute of the Academy of Sciences of the
 Ukrainskaya SSR)

SUBMITTED: March 31, 1962

Card 4/4

S/181/63/005/003/009/046
B102/B180

AUTHORS: Gurzhi, R. N., Azbel', M. Ya., and Hao Pai Lin

TITLE: Surface effects in infrared optics

PERIODICAL: Fizika tverdogo tela, v. 5, no. 3, 1963, 759-768

TEXT: The surface impedance of metals in the infrared region has frequently been investigated, and with the most generalization, by L. P. Pitayevskiy. The present authors calculate the contribution to impedance made by electron collisions with the surface, which has not been accurately taken into account. The electron gas is considered as a Fermi fluid with arbitrary anisotropic dispersion law governing the quasiparticles, and the effect of this anisotropy is studied. The skin effect depends mainly on the relation between the frequency of the applied field and the characteristic parameters of the conduction electrons (v_0 , their velocity at the Fermi surface, their mean free path $l = v_0 \tau$) and on δ the thickness of the skin layer;
 $\delta = \sqrt{\frac{2}{\omega}} \left[1 + \left(\frac{v_0}{c} \right)^2 \right]^{-1/4}$, $\delta_0^{-2} = 4\pi n e^2 / m c^2$. The case $\omega \tau \lesssim 1$ has been fully
Card 1/5

Surface effects in infrared optics

S/181/63/005/003/009/046
B102/B180

investigated and therefore the authors only consider "high" frequencies $\omega \gg 1$ (or $v_0/c \ll 1$). For the infrared range $\omega \ll 1$, $\omega \gg v_0/c$, $\omega \gg v_0/c$, and with the additional assumptions $\omega \gg v_0/c$, $k\theta/\hbar$, the limits of the problem can be given by

$$\omega_0 \gg \omega \gg \omega_0 \frac{v_0}{c} \sim \frac{k\theta}{\hbar}, \quad \frac{kT}{\hbar}, \quad \omega_0 c, \quad \omega_0 \left(\frac{kT}{\hbar \omega_0} \right)^2, \quad \omega_0 \left(\frac{\omega}{\omega_0} \right)^2. \quad (7a)$$

The electron-phonon collision frequencies for normal (superscript n .) and abnormal (ab.) skin effect are thus given by

$$v_{e,f}^{n} \sim \begin{cases} \frac{kT}{\hbar}, & T \gg \theta, \\ \frac{k\theta}{\hbar} \left(\frac{T}{\theta} \right)^5, & T \ll \theta. \end{cases} \quad v_{e,f}^{ab} \sim \frac{k\theta}{\hbar} \begin{cases} \left(\frac{T}{\theta} \right)^3, & \hbar\omega \ll kT, \\ \left(\frac{\hbar\omega}{k\theta} \right)^3, & \hbar\omega \gg kT. \end{cases}$$

Card 2/5

S/181/63/005/003/009/046
B102/B180

Surface effects in infrared optics

The electromagnetic properties of the electron gas are defined by $\epsilon'_0 = -\frac{\omega_p^2}{\omega^2}$,

$$\epsilon''_0, \epsilon'_1 \sim |\epsilon'_0| \frac{v}{\omega} \sim \frac{\omega_p^2 v}{\omega^3}, \quad \epsilon = \epsilon' + i\epsilon''; \quad \zeta = \frac{c}{4\pi} Z = \zeta' + i\zeta'' \sim \frac{1}{\sqrt{\epsilon}}, \quad \zeta'' \sim \frac{\omega}{\omega_0}, \quad \zeta' \sim \frac{v}{\omega_0} \quad \text{where}$$

ζ is the surface impedance. $\nu = \nu_{ce} + \nu_{ef} + \nu_{ei} + \nu_{eff}^{surf}$; $\nu_{eff}^{surf} \sim v/c \sim v_0/c$.

The problem is first considered in neglect of the effects of the Fermi fluid. As usual, the kinetic equation and the Maxwell equations have to be solved jointly. The results are

$$\left(\hat{Z}_{\alpha\beta}^{-1} \right)_{\alpha\beta} = \frac{\pi v_0}{4\pi} \left\{ Q_{\alpha\beta} - \frac{K_{\alpha\alpha}(0) Q_{\beta\beta} + K_{\beta\beta}(0) Q_{\alpha\alpha}}{K_{\alpha\alpha}(0)} + \frac{K_{\alpha\alpha}(0) K_{\beta\beta}(0) Q_{\alpha\alpha}}{K_{\alpha\alpha}^2(0)} + \right. \\ \left. + \int_0^\infty \int_0^\infty L_{\alpha\beta}(|\zeta - \zeta'|) \chi_\alpha(\zeta) \chi_\beta(\zeta') d\zeta d\zeta' \right\} \equiv \frac{3}{16} \frac{c}{4\pi} \frac{v_0}{\omega} \left(\frac{\omega_0}{\omega} \right)^2 m_{\alpha\beta}; \\ Q_{\mu\nu} = \frac{3}{4\pi \rho_0 v_0^2} \int_{\omega, \omega' > 0} \frac{dS}{\omega} v_\mu v_\nu.$$

(14)

Card 3/5

Surface effects in infrared optics

for a cubic lattice

S/181/63/005/003/009/046
B102/B180

$$\zeta_{\alpha\beta} = \frac{c}{4\pi} Z_{\alpha\beta} = i\delta_{\alpha\beta} \frac{\omega}{\omega_0} + \frac{3}{16} \left(\frac{\omega_0}{\omega} \right)^2 \frac{v_0}{c} m_{\alpha\beta}, \quad (15)$$

where

$$\left. \begin{aligned} L_{\mu\nu}(\zeta) &= \frac{3}{4\pi p_0^2} \int_{v_x > 0} \frac{dS}{v} \frac{v_\mu v_\nu}{v_x} e^{-i\zeta}, \quad \mu, \nu = x, y, z; \\ \eta &= \frac{4\pi n_0^2}{m\omega^2} = \frac{\omega_0^2}{\omega^2}; \quad n = \frac{8\pi}{3} \left(\frac{p_0}{h} \right)^3; \quad m_0 = \frac{p_0}{v_0}. \end{aligned} \right\} \quad (12b)$$

$$K_{\mu\nu}(\zeta) = \frac{3}{4\pi p_0^2 v_0} \int_{v_x > 0} \frac{dS}{v} v_\mu v_\nu e^{-i\zeta}, \quad (13a)$$

$\gamma = iv_0/v_z$. Allowing for the Fermi fluid effects (14) and (15) remain
Card 4/5

Surface effects in infrared optics

S/181/63/005/003/009/046
B102/B180

valid if

$$L_{\mu}(\zeta) = \frac{3}{4\pi p_0^2} \oint_{v_s > 0} \frac{dS}{v} v_{\mu} \exp(-\zeta \hat{\gamma}) \frac{v_s}{v_s},$$

$$\hat{\gamma} \psi(p) = \oint \frac{dS'}{v'} \Phi(p, p') \psi(p'),$$

$$K_{\mu}(\zeta) = \frac{3}{4\pi p_0^2 v_0} \oint_{v_s > 0} \frac{dS}{v} v_{\mu} \exp(-\zeta \hat{\gamma}) (1 + \hat{\Phi}) v_s,$$

$$Q_{\mu} = \frac{2}{4\pi p_0^2 v_0^2} \oint_{v_s > 0} \frac{dS}{v} v_{\mu} (1 + \hat{\Phi}) v_s (1 + \hat{\Phi}) v_s,$$

$$\hat{\gamma} = i \frac{v_0}{v_s} (1 + \hat{\Phi})^{-1}$$

ASSOCIATION: Fiziko-tehnicheskii institut AN USSR, Khar'kov
(Physicotechnical Institute AS UkrSSR, Khar'kov)

SUBMITTED: September 27, 1962

Card 5/5

S/056/63/044/002/062/065
B188/3102

AUTHOR: Gurzhi, R. N.

TITLE: Minimum of resistance in impurity-free conductors

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no.2,
1963, 771 - 772

TEXT: The occurrence of a low-temperature minimum value of $R(T)$ in wires that are not too thin is investigated. Whereas usually the electrical resistivity of metals or semiconductors, also at low temperature, is due to carrier scattering from lattice defects or boundaries, in pure conductors electron-electron collisions may become predominant at low temperatures, because their frequency drops much more slowly with decreasing temperature than does the frequency of electron-phonon collisions. Electron-electron collisions, however, only contribute to resistivity if transfer processes (Peierls) are taken into account; these are possible if Fermi surface and Brillouin zone are in a certain mutual position. Under the assumption that $d \gg l_{ee}$, $l_v \rightarrow \infty$, and $l_{eff} \sim d^2/l_{ee}$ a hydrodynamic consideration of the electron

Card 1/3

S/056/63/044/002/062/065
B188/B102

Minimum of resistance ...

gas yields the relations $\sigma = \frac{ne^2}{p_0} l_{eff}$ and $l_{eff} = l_v \left[1 - \frac{2}{x} \frac{I_1(x)}{I_0(x)} \right]$; σ is the conductance of a wire of radius r in a longitudinal electromagnetic field, l_{eff} is the effective mean free path, l_{ee} and l_v are the mean free paths with respect to electron-electron scattering and electron scattering from defects, d is the characteristic transverse dimension of the wire, n the electron density, p_0 the maximum momentum, $x = r \sqrt{3} (l_{ee} l_v)^{-1/2}$, $I_n(x)$ a Bessel function with imaginary argument. For $x \ll 1$ one has $l_{eff} \approx l_v x^2/8 = 3r^2/8l_{ee}$. The $R(T)$ can be divided into four sections: (1) $0 \leq T \leq T_1$, $l_{ee} \gg r$, $l_{eff} \sim d$ and $R = \text{const.}$ (2) $T_1 \leq T \leq T_2$; l_{ee} changes from $l_{ee} \sim r$ to $l_{ee} \sim r^2/l_v$ and R drops $\sim 1/T^2$. (3) $T_2 \leq T \leq T_3$; electron-impurity collisions (l_{ei}) predominate over electron-phonon collisions (l_{eph}) and R remains constant and very low. (4) $T > T_3$; $l_{eph}(T_3) \sim l_{ei}$ and R increases $\sim T^5$. Since the minimum of $R(T)$ arises only if $l_v > r$ at T_1 , r has a lower limit; for

Card 2/3

Minimum of resistance ...

S/056/63/044/002/062/065
B188/B102

typical metals $r \geq 10^{-2}$ cm. There is 1 figure.

SUBMITTED: December 21, 1962

Card 3/3

GURZHI, R.N.

Effect of high-order anharmonicities on transfer processes in
solids. Zhur. eksp. i teor. fiz. 45 no.3:750-754 S '63.
(MIRA 16:10)

(Mass transfer) (Nuclear spin)

ACCESSION NR: AP4019241

S/0056/64/046/002/0719/0724

AUTHOR: Gurzhi, R. N.

TITLE: Thermal conductivity of dielectrics and ferrodielectrics
at low temperatures

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 719-724

TOPIC TAGS: dielectric, ferroelectric, thermal conductivity, low
temperature conductivity, quasiparticle collision, phonon collision,
spin wave collision, umklapp process, normal collision, heat con-
ductivity coefficient, temperature dependence, dependence on speci-
men size

ABSTRACT: In view of certain difficulties that have arisen in the
past with the theory of thermal conductivity of dielectrics, a hydro-
dynamic equation of the Navier-Stokes type is derived and used to
investigate the thermal conductivity of dielectrics and ferrodielec-

Card 1/3

ACCESSION NR: AP4019241

trices. The study is restricted to the low temperature region when collisions between quasiparticles (phonons or spin waves) accompanied by umklapp processes are much less probable than collisions without umklapp. It is shown that these normal collisions, which by themselves do not lead to thermal resistance, can significantly impede the transfer of momentum from the gas of quasiparticles to the boundaries of the sample or to other macroscopic deformations (dislocations or single-crystal faces) in sufficiently large and pure samples. Account of these factors leads to a significant change both in the magnitude of the coefficient of thermal conductivity and in its dependence on the temperature and on the dimensions of the sample. In dielectrics at low temperatures the phonon interaction is principally via three-phonon processes. In ferroelectrics the heat transport is basically governed by spin waves. Orig. art. has: 2 figures and 4 formulas.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AP4019241

SUBMITTED: 20Jul63

DATE ACQ: 27Mar64

ENCL: 00

SUB CODE: PH

NO REF SOV: 006

OTHER: 006

Card 3/3

~~L 11824-65~~ EWT(1)/EPA(s)-2/EWT(m)/EWP(w)/EWA(d)/EWP(t)/EWP(b) Ft-10/P1-4
AFWL/SSD/ASD(a)-5/AS(mp)-2/AFETR/RAEM(a)/ESD(gs) JD

ACCESSION NR: AP4047909

S/0056/64/047/004/1415/1426

AUTHOR: Gurzhi, R. N.

TITLE: Distinguishing features of electric conductivity of metals
at low temperatures

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47,
no. 4, 1964, 1415-1426

TOPIC TAGS: low temperature research, metal, electric conductivity,
electron phonon interaction, crystal lattice defect, electron scat-
tering

ABSTRACT: The electrical conductivity of metals at low temperatures
is treated for the case where, aside from scattering of electrons by
static lattice defects and sample boundaries, the only processes
with any sizeable probability are collisions between electrons and
phonons without umklapp. The effect of such collisions depends

Card 1/3

L 14831-65

ACCESSION NR: AP4047909

3

strongly on the nature of the residual resistance. If electron scattering from sample boundaries (or from other macroscopic objects) predominates, then the conduction resembles under certain conditions the flow of a viscous charged fluid. The dependence of the resistance on the temperature and on the transverse dimensions of the sample is then complicated and in particular, there should be a temperature minimum in the resistance. The situation is different when the residual resistance is due to microscopic lattice defects such as impurity atoms, when the resistance versus temperature plot displays a plateau. In the former case the conductivity mechanism is reminiscent of Poiseuille flow of a viscous liquid, for thin samples. In the case of bulky samples, the residual resistance is caused by microscope lattice defects (like impurity atoms), so that processes without umklapp occur only if the electron dispersion is unanisotropic. Then the resistance first increases with temperature, saturates, and again begins to grow. "The author is deeply grateful to I. M. Lifshits, M. Ya. Azbel', M. I. Kaganov, and V. M.

Card 2/3

L 14034-65
ACCESSION NR: AP4047909

2

Tsukernik for valuable discussions. Orig. art. has: 2 figures and 17 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk UkrSSR
(Physicotechnical Institute, Academy of Sciences UkrSSR)

SUBMITTED: 04Apr64

ENCL: 00

SUB CODE: SS, MM

NR REF SOV: 008

OTHER: 007

Card 3/3

L 16501-65 EWT(m)/EWP(b)/EWP(t) ASD(a)-5/AFETR JD
ACCESSION NR: AP5000338 S/0056/64/047/005/1822/1825

AUTHOR: Gurzhi, R. N.

TITLE: Contribution to the theory of the skin effect in metals at
low temperatures 16

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47,
no. 5, 1964, 1822-1825

TOPIC TAGS: electron phonon collision, skin effect, electric con-
ductivity, umklapp process, surface impedance, temperature dependence

ABSTRACT: This is a continuation of an earlier paper by the author
(ZhETF v. 47, 1415, 1964) dealing with the effect of normal colli-
sions between electrons and phonons on the static electric conduc-
tivity of certain metals at sufficiently low temperatures. In the
present article it is shown by analogy that in the case when elec-
tron-phonon collisions unaccompanied by umklapp processes have a

Card 1/2

L 16501-65

ACCESSION NR: AP5000338

high probability, the character of the skin effect is radically changed, and that there is a rather wide range of frequencies in which the surface impedance has an unusual dependence on the frequency and on the temperature. The skin effect remains normal up to higher temperatures than is customary, and the region of anomalous skin effect is greatly reduced on the low frequency side. "The author is deeply grateful to M. Ya. Azbel', and M. I. Kaganov for a discussion of the results." Orig. art. has: 1 figure and 3 formulas.

ASSOCIATION: Fiziko-tekhnicheskii institut Akademii nauk Ukrainsskoy SSR (Physicotechnical Institute Academy of Sciences UkrSSR)

SUBMITTED: 30Apr64

ENCL: 00

SUB CODE: EM, MM

NR REF SOV: 001

OTHER: 001

Card 2/2

GURZHI, R.N.; KAGANOV, M.I.

Effect of interelectron collisions on the optical properties of metals.
Zhur. eksp. i teor. fiz. 49 no.3:941-943 S '65. (MIRA 18:10)

1. Fiziko-tekhnicheskii AN UkrSSR.

L 10654-66 EWT(1)/EPF(n)-2/ETC(n) WP(c) WW/GG
ACC NR: AP6000848 SOURCE CODE: UR/0181/65/007/012/3515/3521

44,55
AUTHOR: Gurzhi, R. N.

ORG: none

21,44,55
TITLE: Concerning second sound in solids

SOURCE: Fizika tverdogo tela, v. 7, no. 12, 1965, 3515-3521

TOPIC TAGS: sound absorption, sound propagation, exciton, spin wave, phonon, spin phonon interaction

ABSTRACT: The solid is regarded in the author's analysis as a system of quasiparticles with arbitrary dispersion law, and the second sound is treated as oscillations of the density of thermal excitations in this system. A system of hydrodynamic equations is derived on the basis of the standard kinetic equation, in which the quasiparticle distribution function is resolved into two components, one describing normal collisions and the other collisions accompanied by quasimomentum loss. It is shown that the damping of second sound in solids is governed by two factors: 1) the finite nature of the mean free path of the quasiparticles with respect to normal collisions, and 2) the presence of collisions in which the quasimomentum is not conserved (Umklapp processes, scattering by lattice defects, etc.). Since the velocity of the second sound and the mean thermal velocity of the quasiparticles have the same order of magnitude, the contributions of the two mechanisms are each proportional to a small parameter, and the total contribution of the two is assumed additive. The case of ferroelectrics, whose specific heat is determined at low temperature essentially by

21,44,55
Card 1/2

L 10654-66

ACC NR: AP6000848

6

spin waves and in which the normal collisions between spin waves are much more probable than normal collisions between spin waves and phonons, a special analysis is employed, wherein the presence of the phonons is disregarded. At low temperatures, the energies of the temperature and magnetic oscillations are of the same order of magnitude, but with increase in temperature, when the number of quasiparticles is conserved in the collisions, separation takes place between the temperature and electromagnetic waves. In the case of ferroelectrics, it is shown that two waves can propagate, one at a velocity nearly equal to that of the electromagnetic wave, and the other at much lower velocity, which exhibits a behavior similar to second sound, except that it has a temperature dependence. Author is deeply grateful to A. I. Shal'nikov and L. P. Mezhev-Deglin for useful discussions and for a preprint of experimental data on solid He⁴. Orig. art. has: 10 formulas. [02]

SUB CODE: 20/ SUBM DATE: 28May65/ ORIG REF: 006/ OTH REF: 005
ATD PRESS: 4169

beli
Card 2/2

L 12181-66 EWT(1)/EWT(m)/EWP(w)/T/EWP(t)/EWP(b)/EWA(m)-2 IJP(c) JD/AT
ACC NR: AP5024716 SOURCE CODE: UR/0056/65/049/003/0941/0943

AUTHORS: Gurzhi, R. N.; Kaganov, M. I.

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR
(Fiziko-tehnicheskii institut Akademii nauk Ukrainiskoy SSR)

TITLE: Effect of interelectron collisions on the optical properties
of metals - 16

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49,
no. 3, 1965, 941-943

TOPIC TAGS: electron collision, electromagnetic wave absorption, in-
ternal photoeffect, electric conductivity, metal property, optic
property

ABSTRACT: For the purpose of analyzing the role of interelectron in-
teractions at optical frequencies, the authors calculate the electro-
magnetic energy absorption coefficient due to this interaction by using
the model of ideal Fermi gas with an arbitrary dispersion law. No
account is taken of the interaction between the electrons. The absorp-
tion coefficient is calculated from the tensor of the specific electric
conductivity and it is shown that although an increase in frequency

Card 1/2

L 12181-65

ACC NR: AP5024716

gives rise to singularities in the frequency dependence of the absorption at certain points, these singularities are quite weak and the quadratic dependence of the absorption coefficient on the frequency can be discerned with assurance for most metals. The results indicate that the intraband transitions can make an appreciable contribution to the absorption at high frequencies and that the deviations from the quadratic dependence are not due solely to the internal photoeffect. Orig. art. has: 4 formulas

SUB CODE: 20/ SUBM DATE: 19Apr65/ NR REF SOV: 007/ OTH REF: 003

Card

ACC NR: AP6036059

SOURCE CODE: UR/0056/66/051/004/1220/1226

AUTHOR: Gurzhi, R. N.; Motulevich, G. P.

ORG: Institute of Physics im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR); Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut, AN UkrSSR)

TITLE: Effect of a periodic lattice potential on the optical properties and other integral characteristics of cubic polyvalent metals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 4, 1966, 1220-1226

TOPIC TAGS: metal property, optic property, optic method, cubic polyvalent metal, Fermi surface, periodic lattice potential

ABSTRACT: Analytic expressions are obtained which make it possible to estimate the effect of a periodic lattice potential on the conductivity electron concentration as determined by optical methods, N_{opt} , as well as on the magnitude of the Fermi surface S_F and electron state density on the Fermi surface γ . The expressions pertain to cubic nontransition polyvalent metals. The calculation is performed to

Card 1/2

ACC NR: AP6036059

first order terms with respect $|V_g|/E_F$, where V_g is the Fourier component of the pseudopotential and E_F is the electron energy on the Fermi surface. The formulas are employed for determining N_{opt} for lead and aluminum. The effect considered leads to a much smaller value of N_{opt} than that of N_{val} (N_{val} is the valency electron concentration). However, it does not completely explain the difference $N_{val} - N_{opt}$ observed experimentally. The authors express their gratitude to V. L. Ginzburg, L. V. Keldysh and L. P. Pitayevskiy for discussions of problems pertaining to this work. Orig. art. has: 19 formulas and 1 figure. [Authors' abstract] [AM]

SUB CODE: 20, 11/SUBM DATE: 04May66/ORIG REF: 008/OTH REF: 003/

Card 2/2

1951, S. 1.

GRIMSH, T. A. -- "Investigation of the System of Lubricating Tractor
Carburetor Engines." Min Higher Education Ukrainian SSR. Ukrainian
Order of Labor Red Banner Agricultural Inst. Khar'kov, 1955
(Dissertation for the Degree of Candidate in Technical Sciences).

SD: Knishnaya Litovsk ', No 9, 1956

GURZHI, S.I. [Hurzhi, S.I.]

First results obtained from operating tractor-driven machinery
at increased speeds. Mekh. sil'. hosp. 12 no. 1:13-14 Ja '61.
(MIRA 14:1)

1. Direktor Khar'kovskoy issledovatel'skoy stantsii Ukrainskogo
nauchno-issledovatel'skogo instituta mekhanizatsii i elektrifika -
tsii sel'skogo khozyaystva.
(Agricultural machinery)

GURZHIY, D.V.

/ Diabases and serpentinites of the crystalline massifs of Eakhov (Carpathian Mountains). L. G. Tkachuk, D. V. Gurzhiy, and A. I. Krivin (Inst. Econ. Geol., Acad. Sci. U.S.S.R., Lvov). *Doklady Akad. Nauk S.S.S.R.* 104, 6912-15 (1955).--Abundant diabase intrusions in the described area are locally differentiated to serpentinites and other ultrabasics which appear as erosion "windows" in the Lower Cretaceous sediments called "black section" (especially calcareous sandstones, argillaceous schists, and limestones) and Senoman breccias (called the Solmul suite). The contacts of these sediments with the diabases are typical dense hornfelses developed in a thickness of 10-20 cm. The plagioclase (high in Ab) of the diabases is usually strongly saussuritized, with abundant formation of pumpellyite, chlorite, and calcite; the pyroxene (angle $c: y = 44^\circ$) is a diopside-hedenbergite. Sphene is only an accessory. The chem. analyses show that the diabases are particularly high in SiO_2 and low in alkalis. The serpentinites contain chrysotile and antigorite, associated with calcite (up to more than 20%) and little magnetite and Fe hydroxides (about 1%). The ultramafic character of these serpentinites is highly probable. This conclusion is important for ore prospecting since Krivin recently established the presence of ultrabasics also in the northern Jurassic region of the Marmarosh ridge. The geol. facts of an Upper Jurassic (Titonian) to Upper Cretaceous (Senoman) volcanism in the eastern Carpathian Mountains are in agreement with these results. The differentiation in these volcanic bodies has the tendency to enrich SiO_2 in the diabases, but to decrease Al_2O_3 and to change the ratio of $FeO:MgO:CaO$ in favor of FeO and CaO . The peridotites and serpentinites are late volcanic products in this series. W. Rittel

TEACHUK, Luk'yan Grigor'yevich; GURZHIY, Dmitriy Vasil'yevich; RIFUN,
Mariya Borisovna; PORFIR'YEV, V.B., otvetstvennyy redaktor;
LISENHART, D.K., redaktor izdatel'stva; SIVACHENKO, Ye.K., tekhnicheskiiy redaktor

[Lithology of Miocene deposits of the Chernovitsy and Southeastern parts of Stanislav Province] Litologiya miotsenovykh otlozhenii Chernovitskoi i iugo-vostochnoi chasti Stanislavskoi oblasti. Kiev, Izd-vo Akademii nauk USSR, 1956. 128 p. (MIRA 9:7)

1. Chlen-korrespondent AN USSR (for Porfir'yev)
(Stanislav Province--Petrology)

GURZHIY D.V.

PORFIR'YEV, V.B., otvetstvennyy redaktor; LADYZHENSKIY, N.R., kandidat geologo-mineralogicheskikh nauk, redaktor; LAZARENKO, Ye.K., redaktor; GURZHIY, D.V., kandidat geologo-mineralogicheskikh nauk, redaktor; ZAVIRYUKHINA, V.N., redaktor; ZHUKOVSKIY, A.D., tekhnicheskiiy redaktor

[Papers on the problem of the origin and migration of petroleum]
Materialy diskussii po probleme proiskhozhdeniya i migratsii nefti.
Kiev, 1956. 366 p. (MLRA 10:3)

1. Akademiya nauk URSR, Kiyev. L'vivskiy filial. Instytut geologii korysnykh kopalyn. 2. Chlen-korrespondent Akademii nauk USSR (for Profir'yev, Lazarenko)
(Petroleum geology)

GURZHIY, D. V.

Category: Romania

D

Abs Jour: RZh--Kh, No 3, 1957, 7830

Author : Tkachuk, L. G., Gurzhiy, D. V., and Krivin, A. L.

Inst :

Title : New Data on the Diabases and Serpentinities of the Rakhov
Crystalline Massif (Carpathians)

Orig Pub: Dokl. AN SSSR, 1955, Vol 10⁴, No 6, 912-915; AN. Rom.-Sov. geol.-
geogr., 1956, Vol 10, No 3, 52-56 (in Romanian)

Abstract: On the basis of an investigation of the chemical and petrographic composition and the conditions of the formation of the diabases and serpentinites of the above-indicated massif, it has been established that the diabases and related rocks are related to a prolonged volcanic activity (from the upper Jurassic to the upper Cretaceous) and difference in their chemical composition can be explained by postulating that the differentiation of the magmatic reservoir proceeded in the direction of a decrease in SiO_2 , an increase in Al_2O_3 , and changes in

Card : 1/2

-13-

Category: Romania

D

Abs Jour: RZh--Kh, No 3, 1957, 7830

the ratio of the oxides in the $\text{FeO}:\text{MgO}:\text{CaO}$ in the favor of FeO and CaO. A chemical analysis on one serpentinite and three diabases is given.

Card : 2/2

-14-

GURZHIY, DMITRIY VASIL'YEVICH

TKACHUK, Luk'yan Grigor'yevich; GURZHIY, Dmitriy Vasil'yevich; PORFIR'YEV,
V.B., akademik, otvetstvennyy redaktor; OVCHAROVA, Z.G., redaktor
izdatel'stva; ROZENTSVYIG, Ye.N., tekhnicheskiy redaktor

[Rakhov crystalline massif (in the Carpathians)] Rakhovskii kristalli-
cheskii massiv (Karpaty). Kiev, Izd-vo Akad.nauk USSR, 1957. 123 p.
(MLRA 10:8)

1. Akademiya nauk USSR (for Porfir'yev)
(Transcarpathia--Rocks, Crystalline and metamorphic)

TKACHUK, L.G. [Tkachuk, L.H.]; GURZHIY, D.V. [Hurzhii, D.V.]; KOLTUN, V.I.;
RIPUN, M.B.

Progress in petrographic studies of western regions of the
Ukraine during the Soviet regime. Pratsi Inst. geol. kor.
kop. AN URSR 1:108-117 '59. (MIRA 14:6)
(Ukraine—Petrology)

GURZHIY, D.V. [Hurzhii, D.V.]

Conference on the study of native sulfur deposits. Geol. zhur. 19
no.4:112-113 '59. (MIRA 13:1)
(Sulfur)

TKACHUK, L.G. [Tkachuk, L.H.]; GURZHIY, D.V. [Hurzhii, D.V.]; KOLTUN, V.I.

Clay oolites in old sedimentary formations of the Russian Platform.
Geol. zhur. 20 no.2:84-89 '60. (MIRA 14:5)
(Russian Platform--oolite)

GURZHIY, D.V. [Hurzhii, D.V.]

New find of a tuff in the southwestern margin of the Russian
Platform. Geol.zhur. 22 no.2:85-87 '62. (MIRA 15:4)

1. Institut geologii poleznykh iskopayemykh AN USSR.
(Dniestr Valley--Volcanic ash, tuff, etc.)

GURZHIY, D.V. [Hurzhii, D.V.]

Interdepartmental Conference on the Distribution of Oil and Gas
Fields in the Volga-Ural Oil- and Gas-Bearing Area. Geol.zhur. 22
no.2:112-114 '62. (MIRA 15:4)

T. Institut geologii poleznykh iskopayemykh AN USSR.
(Volga-Ural region--Petroleum geology--Congresses)
(Volga-Ural region--Gas, Natural--Congresses)

GURZHIY, D.V. [Hurzhii, D.V.]

Lithological characteristics of the Sarmatian sediments in the
internal zone of the cis-Carpathian trough. Dop. AN URSR no.6:
819-821 '63 (MIRA 17:7)

1. Institut geologii goryuchikh iskopayemykh AN UkrSSR. Pred-
stavleno akademikom AN Ukr-SSR V.B. Porfir'yevym [Porfir'iev,
V.B.]

GURZHIY, D.V.[Hurzhii, D.V.]; SEN'KOVSKIY, Yu.M.[Sen'kovs'kyi, IU.M.]

Genesis of Cenomanian beidellite clays in the Dniester Valley.
Geol. zhur. 23 no.2:82-87 '63. (MIRA 16:6)

1. Institut geologii goryuchikh iskopayemykh AN UkrSSR.
(Dniester Valley--Beidellite)

LADYZHINSKIY, N.R. [Ladzhyns'kyi, M.R.]; GURCHIIY, D.V. [Hurzhii, D.V.]

Ophiolitic rocks of Mount Petrosk in the Magura zone. Dop. AN
URSR no. 6:789-791 '64. (MIRA 17:9)

1. Institut geologii i geokhimii goryuchikh iskopayemykh.
Predstavleno akademikom AN UkrSSR V.B.Porfir'yevym [Porfyr'iev,
V.B.]

GURZHIY, D.V. [Hurzhii, D.V.]; KOLTUN, V.I.

Upper Cretaceous siliceous rocks in the surroundings of Hava-
Russkaya. Geol. zhur. 25 no.2:57-63 '65. (MIRA 18:6)

1. Institut geologii i geokhimii goryuchikh iskopayemykh AN UkrSSR.

USSR / Cultivated Plants. Technical, Oleaceous, Sugar Bearing
Plants.

M-6

Abs Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58676

Author : Senchenko, G. I.; Gurzhiy, E. S.

Inst : Not given

Title : New Method of Hemp Selection

Orig Pub : Len i konoplya, 1957, No 5, 32-34

Abstract : Methods of continuous individual selection and of family-group selection of the best elite plants are described. According to the new method, individual selection is used during the first 2-3 years, and the family-group selection is used in subsequent years. The new method permits to create early ripening high fiber yielding hemp varieties more rapidly. With the aid of this method, a new selection variety,

Card 1/2

111

USSR / Cultivated Plants. Technical, Oleaceous, Sugar Bearing
Plants.

M-6

Abs Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58676

Glukhovskaya I, which has been located in the
Mogilevskaya and Minskaya oblasts of the ESSR since
1956, was created. -- A. M. Smirnov

Card 2/2

GURZHIY, Fedor Mikhaylovich; DOBYCHINA, I.N., red.; OKOLELOVA,
Z.P., tekhn. red.

[Successes of poultry raisers on the "Maiak" Collective
Farm] Uspekhi ptitsevodov kolkhoza "Maiak." Moskva, Sel'-
khozizdat, 1963. 58 p. (MIRA 17:1)

1. Zaveduyushchiy ptitsevedcheskoy fermoy kolkhoza "Mayak"
Chigirinskogo rayona Cherkasskoy oblasti (for Gurzhiy).

L 2337-66 FSS-2/EWT(1)/T/EED-2/EED(b)-3 IJP(c)
ACCESSION NR: AP5022452

UR/0209/65/000/009/0006/0015

AUTHORS: ^{44 55} Gurzhiy, I. (Guards colonel, Military pilot first class); Makhnov, V. ^{44 55} (Guards major, Military navigator first class); Ryzhkov, A. (Guards major, Military navigator first class); ^{44 55} Danilov, N. (Guards captain, Military navigator first class)

TITLE: The observer over the field of battle

44
B

SOURCE: Aviatsiya i kosmonavtika, no. 9, 1965, 6-15

TOPIC TAGS: aerial reconnaissance, combat surveillance, reconnaissance training, military science, military training ^{44 55}

ABSTRACT: The training requirements for aerial reconnaissance are discussed, and a complete training program is examined. World War II experience showed that combat observers must be outstanding fliers, capable of operating under adverse weather conditions and against strong enemy aircraft defenses, and must possess initiative, intelligence, and flexibility in order to overcome unforeseen obstacles in the target area. After a thorough pilot training, they must study the tactics of ground units in order to be able to analyze quickly and accurately all military situations. The observers must be familiar with all reconnaissance equipment. A particular consideration must be given to adapting observers to faster-flying

Card 1/2

L 2337-66

ACCESSION NR: AP5022452

0

reconnaissance aircraft. Each mission must be planned before its launching, even to preliminary drafting of radio messages transmitted during flight. During the flight the observer must be alert for unexpected reconnaissance opportunities, and the flight must be flexible enough to cope with aggressive enemy counteraction. After the flight, the photographic material should be analyzed and related to visual observations, the ground commanders should indicate the merits and defects of an operation, the technical nature of the flight should be reviewed, and enemy defenses should be noted in order to make future reconnaissance flights more effective. Orig. art. has: 8 pictures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MS

NO REF SOV: 000

OTHER: 000


Card 2/2

GURZHIY, Ivan Aleksandrovich [Hurzhii, I.O.], doktor istorychnykh nauk;
LESHCHENKO, Nikolay Nikoiforovich [Leshchenko, M.N.], kand.
istorychnykh nauk; PARASUN'KO, O.A., kand.istorychnykh nauk, red.;
GANUSETS', O.I. [Hanusets', O.I.], red.

[Struggle of the workers in the Ukraine against social and
national oppression during the capitalist era] Borot'ba tru-
diashchykh mas Ukrainy proty sotsial'noho i natsional'nogo
hntu v period kapitalizmu. Kyiv, 1958. 39 p. (Tovarystvo
dlia poshyrennia politychnykh i naukovykh znan' Ukrain's'koi RSR.
Ser.1, no.7). (MIRA 12:2)

(Ukraine--Economic conditions)

GURZHIY, Ivan Aleksandrovich [Hurzhii, I.O.]; GOROVSKIY, F. [Gorovs'kiy, F.],
red.; KADASHNEVICH, O., tekhn. red.

[Origin of the laboring class in the Ukraine; from the end of the
18th to the first half of the 19th century] Zarodzhennia robitnychoho
klasu Ukrainy (kinets' XVIII-persha polovyna XIX st.). Kyiv, Derzh.
vyd-vo polit. lit-ry URSS, 1958. 179 p. (MIRA 11:7)
(Ukraine—Labor and laboring classes)

GURZHIY, I. O.[Hurzhii, I. O.]; MAKARENKO, L. L.; ZHEVAKHOV, P. I.;
DMITRIYENKO, M. F.[Dmytriienko, M. F.], zhurnal'ist

History of names. Nauka i shtetia 12 no.2:33 F '63.
(MIRA 16:4)

(Ukraine—Names, Geographical)

GURZHIY, Lyudmila

Visit: The aeronautical museum in Kharkov. Grazhd. av. 22
no.1:16-17 Ja '65. (MIRA 18:11)

GURZHIY, Lyudmila

A circulation of 35 copies. Grazhd. av. 21 no. 12:11
D '64. (MIRA 18:12)

GURZHIY, P.I., brigadir, gornyy tekhnik

Using the UKR-1 combine to mine 20,215 tons of coal in a month.
Ugol' Ukr. 7 no.7:1-2 J1 '63. (MIRA 16:8)

1. Shakhta "Komsomolets" tresta predpriyatiy ugol'noy
promyshlennosti Gorlovskogo rayona.
(Donets Basin--Coal mines and mining--Labor productivity)

GURZHIY, Petr Kondrat'yevich; ZAV'YALOV, P.F., otv.red.; VINOGRADOVA,
G.V., red.izd-va; IL'INSKAYA, G.M., tekhn.red.

[Instruction for a stope miner in flat and inclined deposits]
Pamiatka gornorabochego ochistnogo rabota na pologikh i naklonnykh
plastakh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu,
1959. 133 p. (MIRA 14:2)

(Stoping (Mining))

GURZHIY, P.K.; KORCHAGIN, N.V.; TKACHENKO, I.I.

Ways of improving the operational supervision of production in coal
mines. Sbor. DonUGI no.28:165-168 '62. (MIRA 16:8)
(Coal mines and mining—Management)

1. The following information is being furnished to you for your information:

Annals of the American Academy of Arts and Sciences
of the American Academy of Arts and Sciences

(1910)

GURZHIYENKO, K.F., inzh.; KONDRASHEV, A.I.

Improving the production of large back-up rolls of 9KhF steel.
Sbor.Novo-Kram.mashinostroi.zav. no.5:39-47 '59. (MIRA 16:12)

KONDRASHEV, A.I.; GURZHIYENKO, K.F.; KOLESNIK, H.M.

Fast heating and cooling conditions in the heat treatment of large
forgings. Sbor.Novo-Kram.masninostroi.zav. no.5:48-61 '59. (MTRA 16:12)

KONDRASHEV, A.I., inzh.; GURZHIYENKO, K.F.; YEGOROVA, Ye.P.

Efficient heat treatment of rolls used in hot rolling and made of
55Kh and 60KhG steels. Sbor.Novo-Kram.maslinostroi. zav. no.5:62-
69 '59.

(MIRA 16:12)

KONDRASHEV, A.I.; KAMALOV, V.A.; GURZHIYENKO, K.F.

Improving the heat treatment of rolls used in cold rolling. Sbor.
Novo-Kram.mashinostroi.zav. no.5:70-83 '59. (MIRA 16:12)

S/129/60/000/012/003/013
E073/E235

AUTHORS: Braun, M. P., Doctor of Technical Sciences, Professor,
~~Gurzhiiyenko, K. F.~~ Kondrashev, A. I., Vinokur, B. V.
and Geller, A. L., Engineers

TITLE: Nickel-less Steel for Large Forgings

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov,
1960, No. 12, pp. 16-17

TEXT: The authors developed the constructional steel 30XГ8Т
(30KhGVT) (0.28-0.35% C; 0.17-0.37% Si; 1.0-1.2% Mn; 0.9-1.2% Cr;
0.7-0.9% W; 0.05-0.10% Ti; $\leq$ 0.030% S and P) the properties of
which are at least as good as those of the hitherto used steel
40XН(40KhN). The steel was smelted in a basic arc furnace and
was cast into ingots weighing about 15.9 tons. From the ingot
specimens were forged, the forgings being of 500 and 700 mm cross-
section. To prevent formation of flocculi the forging was subject-
ed to isothermal annealing. Following that, the influence of
quenching and tempering on the mechanical properties and the
proneness to temper brittleness was investigated. It was found that
with increasing quenching temperature, the properties improved and

Card 1/3

S/129/60/000/012/003/013

E073/E235

Nickel-less Steel for Large Forgings

the proneness to temper brittleness decreased with an only slight deterioration in the plastic properties. The investigations enabled establishing that for the specimen forgings the following heat treatment is desirable: quenching from 900°C in oil and tempering at 600°C. After heat treatment 130 mm thick discs were cut from the specimens for the purpose of investigating the mechanical properties along the cross-section. For the above heat treatment the steel had the following properties: $\sigma_b = 99 \text{ kg/mm}^2$, $\sigma_s = 89 \text{ kg/mm}^2$, $\delta = 17\%$, $\phi = 57\%$, $a_k = 11.3 \text{ kgm/cm}^2$ (cooling in air after tempering) and 12.0 kgm/cm^2 (cooling in water after tempering). It was found that forgings of up to 700 mm cross-section had a sufficiently high hardenability, a high strength and plasticity. The impact strengths and the yield point and strength values did not differ greatly for the two types of steel. For instance, at a distance of $1/3$ of the radius from the surface of a 700 mm cross-section forging, $\sigma_s = 60 \text{ kg/mm}^2$ for $a_k = 7 \text{ kgm/cm}^2$. Towards the centre of the specimen the yield point dropped to 43 kg/mm^2 whilst the impact strength remained the same. The properties of 500 mm

Card 2/3

S/129/60/000/012/003/013
EO73/E235

Nickel-less Steel for Large Forgings

dia forgings were about the same but were more stable throughout the cross-section. The authors recommend using this new steel for large forgings of up to 700 mm cross-section instead of the hitherto used 40KhN steel and for forgings of up to 500 mm cross-sections instead of the hitherto used 35XHM (35KhNM) and 40XHM (40KhNM) steels. There are 4 tables and 7 Soviet references.

ASSOCIATION: Institut liteynogo proizvodstva AN USSR i Novo-Kramatorskiy mashinostroitel'nyy zabod
(Foundry Institute, Academy of Sciences, USSR and
Novo-Kramatorsk Machine Building Works)

✓

Card 3/3

PHASE I BOOK EXPLICATION SOV/5511

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti.
Kiyevskoye oblastnoye pravleniye.

Metallovedeniye i tekhnicheskaya obrabotka (Problemy kachestva i kont-
rol' obrabotki metallov) Moscow, MashStz, 1961. 336 p. Irina ship
inserted. 5,000 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskyy komitet
Soyeta Ministrov UkrSSR. Nauchno-tekhnicheskoye obshchestvo
mashinostroitel'noy promyshlennosti. Kiyevskoye oblastnoye
pravleniye.

Editorial Board: M. P. Braun, Doctor of Technical Sciences, I. Ya.
Dobryay, Doctor of Technical Sciences, D. A. Draygor, Doctor of
Technical Sciences, I. S. Kamenetskiy, Engineer, Ye. A. Markov-
skiy, Candidate of Technical Sciences, V. G. Perynykov, Doctor
of Technical Sciences, and A. V. Chernovol, Candidate of Tech-
nical Sciences; Ed.: M. S. Soroka; Tech. Ed.: M. S.
Gornostayevskaya; Chief Pl., MashStz (Southern Dept.): V. K.
Serdyuk, Engineer.

Card 1/10

PURPOSE: This collection of articles is intended for scientific
workers and technical personnel of research institutes, plants,
and schools of higher technical education.

COVER: The collection contains papers presented at a convention
held in Kiyev on problems of physical metallurgy and methods of
the heat treatment of metals applied in the machine industry.
Phase transformations in metals and alloys are discussed, and
results of investigations conducted to ascertain the effect of
heat treatment on the quality of metal are analyzed. The pos-
sibility of obtaining metals with given mechanical properties
is discussed, as are problems of steel brittleness. The col-
lection includes papers dealing with kinetics of transformation,
heat treatment, and properties of cast iron. No personalities
are mentioned. Articles are accompanied by references, mostly
brief.

TABLE OF CONTENTS:

Strugulin, A. I., Engineer, and L. A. Mel'nikov (Sverdlovsk). Transformation of Austenite Into Martensite Under High Pressure	12
Prutlovskiy, B. A., Engineer, and P. I. Ivanov (Kramatorsk). X-Ray Investigation of the Decomposition Kinetics of Martensite in Tempering at Low Temperature	19
Kocherzhinskiy, Yu. A., Candidate of Technical Sciences (Kiyev). Conditions of Formation of Potentially Austenite in Iron-Carbon Alloys	22
Mirovskiy, E. I., Engineer (Kiyev). The Nature of the Phase Transformation of Carbon Steels	34
Card 3/10	

Physical Metallurgy (Cont.)	SOV/5511
Blanter, M. Ye., Doctor of Technical Sciences, Professor, N. A. Kulakov, Engineer, and I. M. Sargatov (Moscow). Quench-Hardening of Massive Steel Parts in Water-Air Mixtures	167
Braun, M. P., and B. B. Vinokur (Kiyev). Character of Rupture of Chromium-Nickel-Medium Steel	182
Asanov, A. D., Candidate of Technical Sciences (Moscow). Effect of High-Temperature Heating on the Strength Proper- ties of Steel	189
Kondrashev, A. I., Engineer, K. P. Gurzhyenko, and N. M. Kolebnik (Kramatorsk). Accelerated Heating and Cooling Regimes in the Heat Treatment of Large Forgings	196
Kostyko, O. S., Engineer, Ye. P. Dobryanskaya (Magnitogorsk), and M. P. Braun. Development of a Rational Heat-Treatment Regime for Large Forgings	205
Physical Metallurgy (Cont.)	SOV/5511
Vinokur, B. B. (Kiyev). Heat Resistance of Various Alloyed Steels	215
Vanin, V. S., Engineer, and V. K. Titov (Nikolayev). Cementation of Steel in Liquid Organic Media	225
Bunin, K. P., Corresponding Member of the Academy of Sciences, Ukrainian SSR (Dnepropetrovsk) and A. V. Chernovol, Candidate of Technical Sciences (Kiyev). On the Graphite Growth in Cast Iron	229
Zubarev, V. P., Doctor of Technical Sciences, Professor, and P. K. Tushchenko, Engineer (Zhdanov). On the Mechanism of the Silicon Influence on Graphitizing	234
Popova, N. N., Engineer (Khar'kov). Investigation of the Growth of Gray Cast Iron	242
Yatsenko, A. I., Engineer (Dnepropetrovsk). Structural Changes in Austenitizing Ferritic Magnesium Iron	249
Physical Metallurgy (Cont.)	SOV/5511
Zubarev, V. P., Doctor of Technical Sciences, Professor, V. K. Tushchenko, and L. N. Kudryavtsev (Zhdanov). Por- tion of Graphitization Centers and Spatial Features of Their Distribution in the Annealing of Quenched White Cast Iron	258
Titov, V. K., Engineer, and V. S. Vanin (Nikolayev). The Quenching of White Cast Iron and Its Effect on the Graphitization of Segregated Cementite	266
Dubrov, V. V., Engineer (Kiyev). Investigating the Isothermal Decomposition of Cementite in Mangano-Cast Iron	270
Bobro, Yu. G., Candidate of Technical Sciences, Docent (Khar'kov). Effect of Certain Elements on the Properties of Mangano-Cast Irons	281
Kvachina, Ye. I., Engineer (Moscow). Optimum Heating and Cooling Rates in Annealing of High-Strength Spheroidal- Graphite Iron Castings Card 9/10	292
Physical Metallurgy (Cont.)	SOV/5511
Kononova, T. A., Engineer (Moscow). Investigating the Properties of Quenched Mangano-Cast Iron	300
Bychkovskiy, A. I., Engineer (Kiyev). Effect of Heat Treatment on the Transformation of White Tin into Gray	317

S/137/62/000/005/121/150
A160/A101

AUTHORS: Kharchenko, V. A., Gurzhiyenko, K. F., Kondrashov, A. I., Akulinin, M. A.

TITLE: The effect of thermal treatment conditions of forge-heated forgings on the formation and coloring of flakes

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 125, abstract 51769 ("Tr. Donetsk. politekhn. in-ta", 1961, 56, 41 - 53)

TEXT: The investigation of the effect of the process of cooling forged pieces and of the subsequent tempering on the formation of flakes and their coloring was carried out with 34XH3M (34KhNZM) steel composed of 0.35% C, 0.57% Mn, 0.26% Si, 0.90% Cr, 3.12% Ni, 0.31% Mo, 0.018% S, 0.020% P, and containing 6.0 cm³ of H per 100 g during the teeming. The ingot, having a temperature of 700°C and delivered to the forge and press shop, was charged, within two hours, into the furnace with a temperature of 650°C for 6 hours. Then, it was charged into the soaking pit with a temperature of 950°C for 35 hours, and ultimately it was removed with 1,200°C for billeting. After this process, it was

Card. 1/ 2

S/137/62/000/005/121/150
A160/A101

The effect of thermal treatment...

again charged into the furnace with 1,050°C for 17 hours and then taken out for forging. The forging was conducted at 1,200 - 950°C. After the forging, the samples were subjected to various stages of treatment: 1) they were cooled in the air, 2) cooled down to 100°C, and 3) quenched in oil. Immediately after the cooling, one part of the samples was tempered at 650°C for 5 hours; one part was tempered after aging at room temperature for two weeks; and one part remained untempered. The kinetics of the formation of flakes during the process of the hold time at room temperature for 2 to 15 days was investigated by the ultrasonic method. Investigated were also the macrostructure and the flakes with the help of a magnetic flaw detector after an aging process of 1 month. It was revealed that the quantity and the zone of the location of flakes increase in case the cooling rate is increased. The dimensions of the flakes, however, decrease if the cooling rate is raised. An immediate high tempering prevents the formation of flakes. The aging of samples in the air up to the tempering for two weeks, contributes to increase the amount and sizes of flakes. A bright silverish coloring of the flakes in their cross-sectional view is obtained only in the samples subjected to high tempering, as a result of an increase in the plasticity and toughness of the metal. There are 8 references.

A. Babayeva

[Abstracter's note: Complete translation]

Card 2/2

S/123/62/000/009/001/017.
A052/A101

AUTHORS: Kharchenko, V. A., Gurzhiyenko, K. F., Kondrashov, A. I.

TITLE: The temper brittleness of 34XH3M (34KhN3M) Cr-Ni-Mo steel at isothermal annealing

PERIODICAL: Referativnyy zhurnal. Mashinostroyeniye, no. 9, 1962, 19, abstract 9A112 ("Tr. Donetsk. politekhn. in-ta," no. 56, 1961, 115-123)

TEXT: The effect of cooling conditions after isothermal annealing at 650°C (without a recrystallization and with a double recrystallization) on brittleness and mechanical properties of 34KhN3M steel was studied. It has been established that at a slow cooling from 650°C (with the furnace and even in the air) a tendency to temper brittleness is observed.

[Abstracter's note: Complete translation]

Card 1/1

PEL'TS, Ya.; GINZHOV, V.

Measuring equipment and production quality. Standartizatsia
29 no.10:61 0 '65. (MIRA 18:12)